

syllabus for First-Year Experience (FYE 101)



Instructor:	Mark LeBlanc (mleblanc@wheatoncollege.edu)	Open Hours to meet in my office: by appointment
Office:	DC-1322	or MON-TUE 1 – 2:30 pm
Phone:	286-3970 (on campus: x3970)	Meeting: TR 11:00 - 12:20 pm, DC 1315 (“csLab”)

Texts (*selected online sites and tools*) ... **Get a 3-ring Binder** as I will pass out many(!) handouts to facilitate note-taking in class. Please keep an organized binder.

Content:

AI (Artificial Intelligence) is everywhere. The short history and steady progress of AI had featured more hype than reality. Yet, we now find ourselves faced with new data-driven models that exceed many of our expectations, for example in the spaces of “writing” text (ChatGPT, Claude, CoPilot, Gemini) or “creating” images (DALL-E, Midjourney). New career paths are emerging for you and the jobs and careers of the near future will require computational skills that leverage the human and machine interface. But what are the skills needed? This course will expose students to and provide practice working with data, computational tools, and the workflows that drive Machine Learning (ML) applications in almost all disciplines. Skills include locating, storing, managing, “cleaning”, statistically describing, visualizing, and writing about data. Exposure to machine learning workflows includes the use of tools for clustering and classifying data. In addition to the “hands-on” computational work, we will collectively consider the broader potentials, implications, and concerns with AI in our lives. Should we be concerned? Aren’t some AI models biased? Isn’t it cheating to work on drafts of your next paper with an AI? And just how do you fight the instinct to trust a “human-sounding” machine?

Learning Goals and Objectives

Why are these learning objectives important to you? Because computing is and will be a part of your creative output, your work, your career. But computing is not only about “using technology.” Computational thinking is a new(er) way of thinking, abstracting, and problem solving ... solutions that leverage algorithms and computing machines. Sharpening your own computational skills will give *you* leverage in much of your future work. Here are our specific “higher level” **learning goals**:

- To consider the impact, concerns, and scope of Large Language Models (LLM) in our creative and professional worlds
- To appreciate the (relatively brief) history of AI and the context for how machine learning has brought us to where we are today
- To understand and articulate the potential for good as well as the ethical implications and limitations of Artificial Intelligence (AI)

- To sharpen your computational skills including
 - becoming an “expert” in prompt engineering with various chatBots based on LLMs
 - working with and understanding the storage of files containing “big” data
 - appreciating “data scraping” and where models “get” their data
 - becoming proficient when working with spreadsheets, including formulas and small scripts
 - setting up machine learning experiments, including training and testing data sets
 - improve your technical writing on computational topics, including formatting, notation, visualizations, and annotation of diagrams

The more general learning goals include an ability:

- to apply abstraction and decomposition when attacking a large complex task
- to recognize how discrete mathematics topics permeate the discipline of computing

Upon completion of this course, you should meet the following learning objectives:

1. **Technical Writing:** Increase proficiency when communicating about computing topics in writing

1.1 Apply professional notation in written reports

1.2 Demonstrate formatting and writing techniques when drawing and annotating tables of data, graphs, and figures of computational systems.

2. **Collaboration**

2.1 Professionally participate in “meetings” (class), practice note-taking, and use of the whiteboard

2.2 Show initiative with leadership opportunities and practice teamwork

2.3 Engage with peers in discussion on the ethical issues surrounding the use of LLMs

3. **Computing Skills**

3.1 Demonstrate expertise when prompting AI models in multiple domains (exposure to current state-of-the-art chatBot apps based on LLMs, e.g., chatGPT, CoPilot, Gemini, Claude)

3.2 Demonstrate proficiency for demo-ing where in memory your data is stored (pathnames)

3.3 Demonstrate proficiency with spreadsheets

3.4 Apply machine learning algorithms of clustering and classification to various data sets

About your Professor:

Why am I teaching this course? I’m an organized geek who loves computing, and I love to teach and motivate college students to leverage computing, no matter their interests.

How do I define successful learning? A willingness to study, practice, and demonstrate *your* competencies while sharing what you’ve learned in a spirit of collaboration.

What you can expect from me? I will be organized and relentlessly striving to help you map your new computing skills onto your passions. I strive to make requirements transparent and will grade accordingly. I am very open to any discussion or concern about a previous grade.

Goals & Sequence (note: our Canvas site will be modified as needed)

- Weeks **1, 2, 3:** Large Language Models (LLMs): Gaining expertise with chatGPT, Gemini, Copilot, Claude, *et al.* – History of AI – Creating Professional Documents
- Weeks **4-5:** Data Scraping and Data Cleaning: Understanding file structures and pathnames; investigating the past use and ethics of “scraping” -- Working with spreadsheets and data in .csv files
- Weeks **6-7:** Working with Data (real-time data from a continuous glucose monitor)
- Week **8:** Fall Break and Intro to Machine Learning
- Week **9:** Applied Machine Learning: Cluster Analysis of written texts
- Week **10:** More Machine Learning: classification
- Weeks **11-13:** Open Work on Final Project Design and Implementation
- Weeks **14-15:** Final Project Presentations

Expectations

1. **Honor Code Revisited:** It goes without saying that all submitted work will be the student’s own, in keeping with the Wheaton Honor Code. For homework, all work must be your own from beginning to end.
2. **Get a 3-ring Binder:** Your professor will pass out many(!) handouts to facilitate note taking in class. Please keep an organized binder.
3. **Submissions** must be converted to .pdf format and uploaded to our Canvas site.
4. Class attendance and participation is required. In class, you will often work with others to solve problems and practice the terminology of AI (in small groups and/or at the whiteboard). You should consider class meetings like a “briefing” at a real job, thus you must be involved, participate, question, and engage with the material during class time.
5. You “earn” your grade in this course by showing mastery of the **learning objectives** as they appear within and are applied to current topics in computing. In addition to numerous opportunities to “play” in class, your level of mastery is directly dependent on your time practicing and exploring outside of class.
6. The analogies of an athlete or musician are appropriate. You know when you watch a game or listen to a concert, much practice has occurred prior to the game or performance. In fact, most performers would *never* attempt to perform without hours and hours of practice. Is practice glorious? Does anyone cheer? Nope. Yet, returning to the topic of your own work, **it is sometimes the case that a student thinks that one attempt at a problem is sufficient for submission; why is that?** *Think about it.* The spectators in the audience *know* when they see a poorly prepared performer. Your professor (*a.k.a.* your future boss) is in the audience. Be disciplined. Avoid ambiguity. Impress your professor.

Course AI Policy

This course will follow Wheaton's “Unrestricted Use of AI with Acknowledgment” policy.

In this course, I encourage you to use all the tools at your disposal. However, as with any other resource you use to aid your work... *you* must acknowledge the AI tools that you use in the development of your work. We will also agree to include citations and acknowledgments of chatBot use in our reports.

And to be fair, from my faculty point of view, I will include a clear statement in any class materials or assessments that involve AI use.

Assessments & Grades

This course has been designed in compliance with [Wheaton College's credit hour policy](#).

Any and all assigned work will be due at the beginning of class on the assigned date. Thus, if a homework is due on a Wednesday, you must bring your professionally formatted and printed/stapled hardcopy to class that day. Submissions will be collected at the beginning of the class, prior to beginning that day's topic.

Class **attendance** and **participation** is required.

Writing: You will be asked to write up (document) your experimental workflows, summaries, and examples of using tools, including how to format your work and apply professional notation and writing tips and techniques when drawing and annotating diagrams of computational systems. Your submissions will resemble professional documents.

Computational lab skills will be assessed in class. For example, we might practice a new topic with spreadsheets on Wednesday. You will then be asked, in class on Friday, to replicate that type of work. We will view these in-class, hands-on sessions as your demonstration that you are proficient. While you will finish most "labs" during our class time together, our emphasis will be on demonstrating the proficiency of the skill, not the speed of a skill. Thus, you will be allowed to repeat and/or complete unmet proficiencies. The overall goal will be for you to be exposed to and show a level of mastery of a set of computational skills. Grading rubrics will vary depending on the type of work, but you can be assured that your Prof will always be open to your questions on how a certain in-class "lab" might be graded.

Final Projects will be team-based. The grading rubric will include points for teamwork, level of difficulty, and based on your individual contribution.

Your grade:

In-class participation	10%	attendance and participation required each day
Technical Writing	45%	three write-ups: (due dates) (1) chatBots: Sept. 12 (2) spreadsheets: Oct. 6 (3) machine learning: Nov. 12
Lab proficiencies	25%	continual throughout the semester
Final Project	20%	Weeks 11-13: work++ ... preparation, rehearsals Weeks 14-15: presentation

Accessibility Statement

Wheaton is committed to ensuring equitable access to programs and services and to prohibit discrimination in the recruitment, admission, and education of students with disabilities. Individuals with disabilities requiring accommodations or information on accessibility should contact Accessibility Services at the Filene Center for Academic Advising and Career Services via email to accessibility@wheatoncollege.edu or via phone at (508) 286-8215.